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General Notes.

GEOGRAPHY AND TRAVEL.

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Honduras.—Still rising before us are numerous peaks and mountains in different forms. We notice that their tops are crowned by huge barren rocks,—a porphyritic cap. Before ascending these heights we are enabled to trace, in our imagination, the original magnitude and extent of this formation, now only left to us in huge rounded masses or other peculiar forms, in the shape of walls or even columns. Some of the summits have disappeared, but we will find them as debris accumulated at the base. The lithological character of this debris answers in every respect to those rocks, which have remained as monuments of a nearly-destroyed rock-formation once crowning the heights of the Pacific slope of Honduras.

The surface of the mountains is deeply ravined and supplied with creeks, and deep gulches separate the once coherent mountain masses. These wide gulches and river beds are as characteristic of Honduras as the absence of narrow canyons.

The presence of gulches and the absence of narrow cañons in that country is caused by the extreme variation of the water supply by rains in this tropical zone, and its steep slope, producing rapid drainage.

By aid of heavy rains streamlets may pass into torrents, and later into floods, demanding a large area for their agitated waves, which rapidly sweep down the steep slope of the mountain region. There is no rock material in existence which could restrict the suddenly-aroused masses of water into a small or limited area. The surrounding and enclosing rocks are dislocated and carried away till the fierce element has satisfied its demands.

Meteoric events are thus the makers of scenery; the latter will change as soon as the former will assume other conditions, and therefore they are in close relation to each other.

I make a few remarks about the present climatic condition of Honduras. Contrary to ordinary or common belief, Honduras has a a salubrious, healthy climate. The thermometer rises on the low coastlands from 80° up to 100°, but the latter quotation may be considered as one of the high extremes. In an altitude of 2,500 feet we will encounter a constant temperature of about 75–90° F. the whole year round. At 3,500 feet, for example, the altitude of the capital of Honduras, Tegucigalpa, is 70–80° F.; and at Santa Lucia, 4,500 feet, a temperature of 68–75° F. The yearly variation of the already-mentioned places is between 10–15° F., whilst their daily difference is about 5° F. Towards evening northern breezes set in regularly, and render the nights pleasant and comfortable.

The rainy season commences on the Pacific side towards the latter part of April. Heavy showers of rain, accompanied by the constant rolling of thunder and the blinding flash of lightning, occur towards evening, and usually last during the night. The following day is bright, with pure and balsamic atmosphere. Towards the end of the rainy reason the storms commence in the afternoon, and heavy showers may fall continuously during two or three days. We would suppose that the small area of Honduras, which covers only three degrees of latitude, would have a nearly uniform season over the entire territory, which is not at all the case. The rainy season gradually advances from the Pacific coast towards the interior, and from there to the north coast. It thus happens that the Atlantic and Pacific coasts are polar, or opposite, in regard to their seasons. In January the dry season is prevailing on the Pacific coast, whilst there is a wet season on the Atlantic shores. In the interior of Honduras rains are less powerful, but they usually continue longer. On the Atlantic slope the rains are heavier than on the Pacific, which is, most likely, caused by the more vigorous growth of vegetation on the latter coast.

It is quite evident that a territory which originated chiefly through the aid of plutonic and volcanic agency is destined to be most diversified in regard to the diffusion of its valleys and mountains, and more so if we remember that the huge edifice, the Central American continent, is not the effect of *one* upheaval of firm land, or one sudden rise of fused mineral masses, but that this process was a gradual and periodical one, consisting of sudden eruptions, followed by long pauses of rest.

As these eruptions occurred at different times, it may follow that the direction of the eruptive mountain ranges was likewise divergent, which is actually the fact.

Over the whole territory of Honduras there are spread numerous systems of mountain ranges, which usually are called in that country "montanas," and montanitas if of a smaller size. On the western boundary of Honduras these ranges run *usually* from north to south; as, for example, the montanas de Monticillos and the montanas de

Yojoa, whilst on the western portion of this country the mountain-ranges extend nearly from east to west, as is the case with the montanas de Jutegalpa, and the montanas de Tonpocente.

We have thus in Honduras two main directions of mountain extent, —north to south, and east to west,—with a great series of other ranges, which intersect the above directions at various angles.

The zone of extension of these ranges is usually not in form of straight lines, but bent or curved, passing even into a circle, in which case the whole range, with its enclosed surface or valley, assumes a huge crater-form. A similar effect is sometimes obtained by the accumulation of mountain or mineral masses of a different lithological character in a peripheric zone, around an undisturbed centre.

Most of the ranges which present this curved zone of accumulation are but sections of large circles, or waves of undulation, in the center or height of which the protrusion of fused masses occurred.

The topographical structure of Honduras, with its diffused arrangements of mountain ranges of different eruption centers, is therefore most favorable for a display of numerous valleys, which are formed at the expense of large plateaux.

In regard to the shape and origin of the valleys of Honduras, we may make the following classification. Valleys are formed:

1. By the folding up of upheaved, undulating mountain masses.
2. By the accumulation of eruptive masses around an undisturbed center.
3. By the erosive action of water.

The first class of valleys is not often found in Honduras; they principally occur toward the Atlantic or plutonic coast.

The second class is of most frequent occurrence, usually of volcanic origin. Their manner of formation has been already explained by the deposit of fused mineral masses, around a centre which is the actual base of the valley.

The common form of valleys of this class is a round or elongated one, but various other shapes occur, as, for example, oblong ones, as the result of the intersection of two parallel mountain ranges. In fact, it would be impossible for me here to describe the diversified aspects of this class of valleys, originated as already explained, but subjected to manifold alterations by previously-existing objects.

I proceed to another group of numerous valleys, which I may call crater-valleys, as they are nothing but craters or vents of volcanic ranges now inactive. Their ordinary form is circular, and the base of the valleys is from two to ten miles in diameter. Usually they occur in series of from two to six valleys, arranged in a linear direction, and only separated from each other by narrow mountain-ridges, at an elevation above sea level of from six hundred to twelve hundred feet. Such a linear arrangement of crater-valleys we encounter on the volcanic side of Honduras, the Pacific coast, in the neighborhood of the village of Langli.

Before reaching the village we arrive at the foot of the volcanic range, the top of which is provided with a series of craters, formerly the theatre of fiery eruptions, now partly covered with vegetation and inhabited by man.

We ascend the ridge of the mountain range and arrive at its top, when we descend its steep slope, traverse the plain of the valley, and ascending again we find on the top, below us, an exact similar valley as that of Langli, and so on until we have traversed the whole range.

This form of ranges, with their tops provided with a series of funnels or craters, has great resemblance to those which I have previously described as presenting a series of peaks or cones on their summits arranged in a linear succession. In fact, we may call it the same, with the only difference that in the first-mentioned case the figure of the peak or cone is most prominent, whilst in the second case (the valley arrangement) the form of the crater or funnel is more decidedly expressed by nature. These two mountain forms stand in the relation to each other as do the matrix and the mould.

Our third class of valleys—the *erosive valleys*—are, as their name expresses, caused by the erosive action of water, and are the products of the drainage of Honduras. They are of comparatively modern origin, and contain river beds which during the rainy season carry enormous masses of water, producing further erosion, and with it an extension of the valleys in regard to width and depth.

In order to obtain a complete survey of the various past epochs up to the present time let us once more return to the tertiary period.

The idyllic and picturesque valleys of the present Honduras were then for the greater part the theatre of volcanic activity. After a long elapse of time the fiery, eruptive zones cooled down, assisted in this process by water, which came in the form of rain or aqueous ebullitions from the craters. A great number of these craters became thus filled up with water, forming lakes. By aid of the drainage of the volcanic mountain slope, which enclosed, as previously mentioned, large tracts of land, thus forming valleys, the latter were transformed into basins, which became covered with water, thus passing into lakes of large dimensions.

The existence of a large *lake area* during the diluvial period, which I found to have extended nearly over the whole territory of Honduras, is not merely based upon the theory of a necessary accumulation of water in natural basins, on account of the absence of erosive valleys or river systems, but it is founded upon the existence of well-preserved shore-marks and shore-lines of these former lakes.

The lines of the erosive action upon the mountains surrounding our present valleys extend in a *horizontal* direction, dividing the slope of the mountains into two zones, one acted upon by water, the other by air and vegetation, but destitute of these marks. The lines of demarkation between the sea level and the shores are as well preserved and marked as if the lakes were still in existence.

These lines of erosion are *horizontal*, and not *inclined* as those produced by river erosion, and are therefore a strong evidence of the existence of accumulated water or lakes in those valleys bearing those shore-marks.

Descending from the height of the lake shores to the base of the valley, we find in sinking a shaft stratified formations of soil, sand, and clay, containing animal remains. At the present time these lakes have disappeared, but we have one illustrating example left in the form of the lake of Yojoa. This system of former lakes stretched across Honduras. I may mention, as former lake-beds, the valleys of Tegucigalpa, Comayagua, Danli, Portrerius, Santa Barbara, and a great portion of the province of Olancho.

There is an old Indian legend extant among some Indian tribes of Central America which tells us of an underground passage connecting the Atlantic and Pacific oceans, in the form of a natural canal, used by their ancestors for navigation. Might this tradition not have reference to an overground passage through those lakes existing in former or ancient times, perhaps even in the early era of man? The topographical arrangement of the present valleys, formerly craters, passing into reservoirs of lakes, would form a great deal of probability for our supposition, and more so as a similar passage is proposed in the Nicaraguan canal project, which would utilize the existence of the two large lakes, Managua and Nicaragua, which unite, by aid of the river San Juan, with the Atlantic.

The large amount of water spread in ancient times over Honduras must have caused heavy rainfalls, a vigorous growth of vegetation, frequent earthquakes and new eruptions of volcanic material.

These results combined contributed to the wear of the banks of those lakes, and the enclosed water masses found their way to the sea, forming large erosive valleys with river systems connecting the interior directly with the briny waves of the oceans. By aid of this new system of draining the territory a considerable number of lakes lost their former supply of water. Gradually they began to evaporate, lowering constantly their shore-marks, till they were reduced to swamps, and from this passed into the present fertile valleys which we find so frequently in Honduras.

During my exploration in Honduras I never observed glacial marks. The absence of these self-registered graphical records of moving ice masses, would imply either that the glacial period did not exist as such in Honduras, or that the marks or engravings of that period may have been destroyed by the action of water and vegetation. The latter case seems very probable, but the absence of real glacial *moraines* in this country is a strong indication of the non-existence of the glacial period.

The luxuriant forests which, without doubt, have surrounded those *ancient* lakes were inhabited and visited by gigantic mastodons and alligators, numerous remains of which we frequently find in a state of good preservation from ten to fifty feet below the alluvial grounds of former swamps or lakes. As mastodon localities I mention the valleys of Danli, Portrerius, Santa Gracias, Santa Rosa, Santa Barbara, and Olancho. Inasmuch as we find nearly whole skeletons of mastodons in certain places, we may conclude that these animals existed in close neighborhood to their present burial-places, and were not carried from afar by streams or rivers. The mastodon remains are in size and form nearly corresponding to the New York mastodon, with the exception that the tusks of the Hondurian mastodon are less curved, and are therefore nearly straight. With the lakes disappeared also the gigantic mastodon, but of their associates, the tapir and the wild boar have been left behind in present Honduras.

A new scene—a psychozoic one—is going to unroll itself before our eyes. The swamps have partly passed into fertile grounds, covered with valuable woods, inhabited by animals, which provide an abundant supply of food for man, and richly impregnated with mineral substances, which were ejected from the interior of the earth through large fissures in which they deposited, forming mineral accumulations of considerable value.

Such was the country given by nature to daring man! He soon appears before us, not as an uncivilized giant or savage, but as a man accustomed to comfort and experienced in art and music. In Honduras no *woeful remains* of giants are found, and most likely never will be discovered; but we find, nevertheless, abundantly, genuine remains, in form of temple and sacrificial mounds, containing vases, idols, ornaments, and arms.

From the character of the painting on a large vase, in excellent preservation, excavated at Oropoli, in Honduras, we feel strongly inclined to attribute the vase to a nation who came in contact with Israelites, Persians, or Egyptians. The face of the main figure is of Hebrew cast; the costume is Asiatic; Persian hat, with Egyptian veil or head-dress, and long narrow boots; seated on a high Egyptian throne, holding two clarionets in the hand. The scene represented is that of snake-charming, which art is usually found with Asiatic people. If we remember that the Phœnicians, whose history is yet half concealed in the dim twilight of human records, penetrated far out on the Pacific ocean, we must not wonder if future archæological discoveries in Mexico and Central America should prove a close relation between the Aztecs, or the first settlers in Honduras, with an Asiatic people who might have reached the shores of the New World by aid of navigation.

With these archæological remains, which indicate a high grade of civilization on the part of their manufacturers, we find sometimes crude implements, as arrowheads, hatchets made of greenstone, idols of clay and jade. The idols of this race are also of an Asiatic character. There are yet direct descendants of this race living in Honduras, usually called Indians, but their whole appearance, their plays and traditions, are Asiatic. How did this race reach Central America? is what we ask. Most likely by emigration from Asia *via* Behring Strait to North America, and from there to Central America, in a similar manner as the mastodon extended its migrations from the southern part of Europe, Asia, and North America down to Central America.

The Asiatic or Mongolic tribes, as, for example, the Alans and Huns, at an early period of our history undertook large migrations, conquering a large portion of Europe. Should not similar large Asiatic migrations have extended towards the northern part of Asia, driving its inhabitants over the Behring Strait to the American continent?

The American continent, probably once known to some Asiatic people, became forgotten.

On the 14th of August, 1502, the precise records of history mention the American continent in their annals. On that date Christopher Columbus appeared before the Cape Casinas on Honduras territory, and entered for the first time the American continent as the first stranger who rediscovered America in our historical time.

We know enough of the cruel Spanish systems of oppression and barbarities. The Spaniards were compelled on the 15th of September, 1821, after some struggle with the natives of Central America, to resign their assumed rights over that country and its people.

Central America divided itself politically into the republics of Honduras, Guatemala, Salvador, Nicaragua, and Costa Rica, all of which abolished slavery as one of their first acts. Honduras, a constitutional republic, is at the present time in a very prosperous condition. Its doors are opened for commerce, and its coasts and interior offer ample rewards for the industrial enterprises of man. The wheel of time, producing changes, is never at rest. M. J. R. FRITZGAERTNER.

GEOLOGY AND PALEONTOLOGY.

On a New Dog from the Loup Fork Miocene.—AELURODON COMPRESSUS sp. nov. Represented in my collection by a single mandibular ramus of the left side, and by two rami in the collection of the Museum of Comparative Zoology of Cambridge. The latter have been referred by Professors Scott and Osborn to the *Ae. hyaenoides* Cope (Bulletin Mus. Compar. Zoology, 1890, December), but I find on direct comparison with the type that the species is different. When the heel of the inferior sectorial is placed in position on the first tubercular superior molar of the *Ae. hyaenoides*, the second superior tubercular of the latter does not reach the second inferior tubercular of the *Ae. compressus;* and the posterior border of the superior canine marks the middle of the penultimate inferior premolar of the latter.

The canine in the *Ae. compressus* is rather small, while the sectorial and first tubercular are large. The fourth premolar is one-rooted, and the third has two distinct roots, and is nearly as large as the second. The crowns of these teeth are not preserved in the specimen. The first inferior premolar is not so robust as in the *Ae. sævus* Leidy and other species, but is more compressed. It has a strong posterior cutting lobe, and a low posterior basal cingulum. No anterior basal cusp or cingulum. The heel of the sectorial is as wide as long, and is half as long as the blade. The anterior border of the latter overlaps a little the heel of the first premolar on its inner side. The borders of the heel are of equal elevation. Roots of first tubercular divergent. Root of second tubercular compressed and situated on the oblique base of the coronoid process. The ramus mandibuli is rather shallow